

# UK Patent Application GB 2 283 425 A

(43) Date of A Publication 10.05.1995

(21) Application No 9321542.4

(22) Date of Filing 19.10.1993

(71) Applicant(s)

Yong Siang Toi  
299 Bedok South Avenue 3, #02-11 Bedok Court,  
Singapore 1646, Singapore

(72) Inventor(s)

Yong Siang Toi

(74) Agent and/or Address for Service

Heseltine Lake & Co  
Hazlitt House, 28 Southampton Buildings,  
Chancery Lane, LONDON, WC2A 1AT,  
United Kingdom

(51) INT CL<sup>6</sup>  
A61M 5/50

(52) UK CL (Edition N )  
A5R RGG R201

(56) Documents Cited

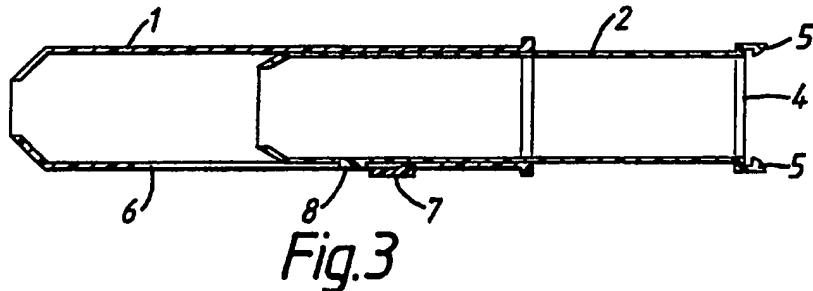
GB 2208604 A    GB 2202748 A    GB 2202747 A  
US 4998924 A    US 4923447 A    US 4874384 A

(58) Field of Search

UK CL (Edition N ) A5R RGG  
INT CL<sup>6</sup> A61M 5/32 5/50

(54) Protective sheath for a syringe

(57) A protective sheath for a syringe having a needle comprises a tube which can slide on the barrel of the syringe and move from an inoperative position to a locked extended position where it shields the needle. Alternatively, the sheath can comprise two tubular members 1, 2 the inner one retaining the syringe by means of clips 5 and the outer tube sliding on the inner so that it can move to a locked extended protecting position. The latter embodiment does not require the syringe to be modified.

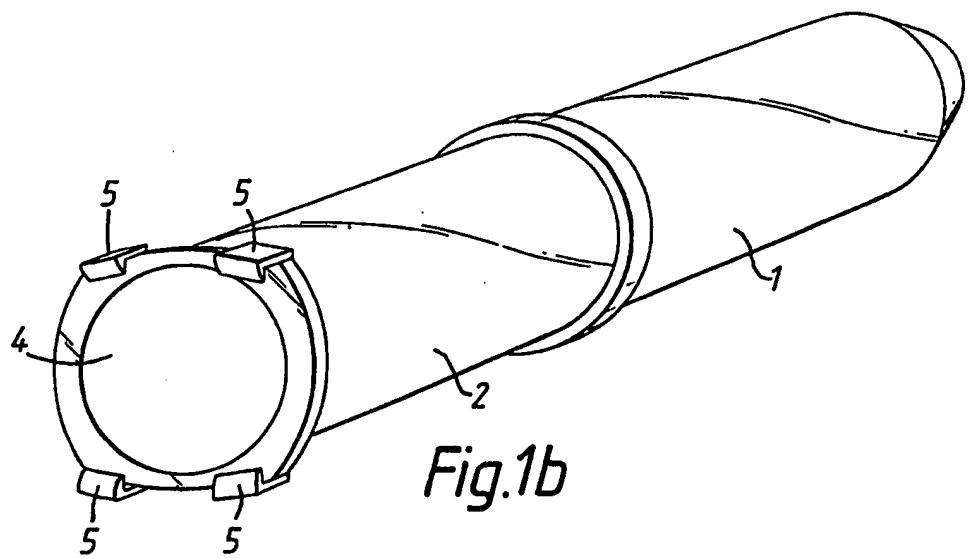
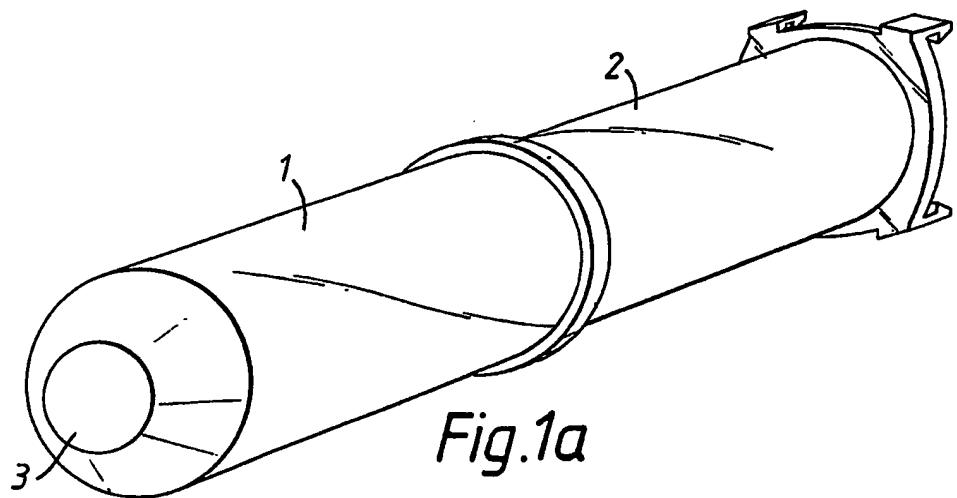


GB 2 283 425 A

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1990.

1/5



2/5

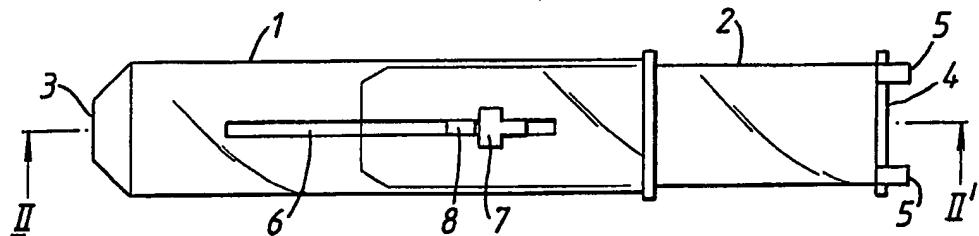


Fig. 2

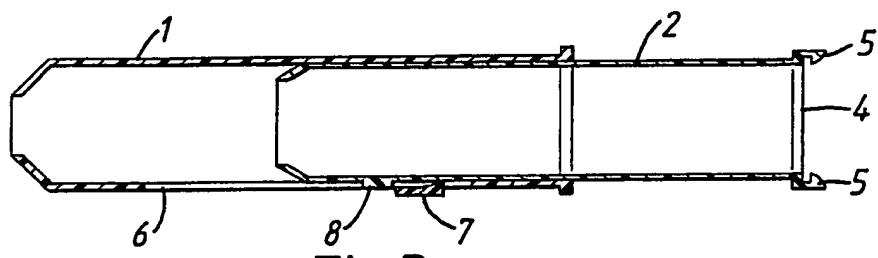


Fig. 3

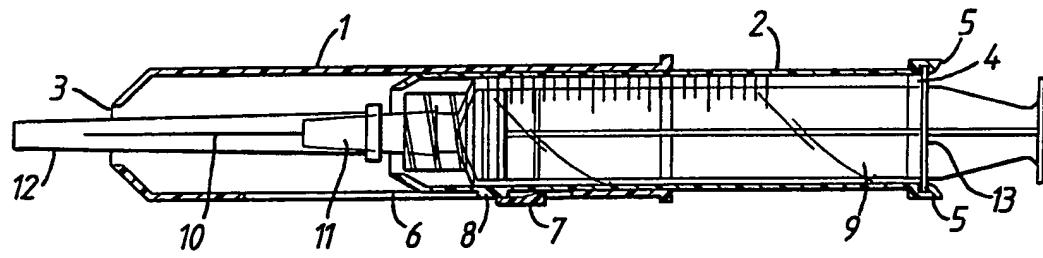


Fig. 5

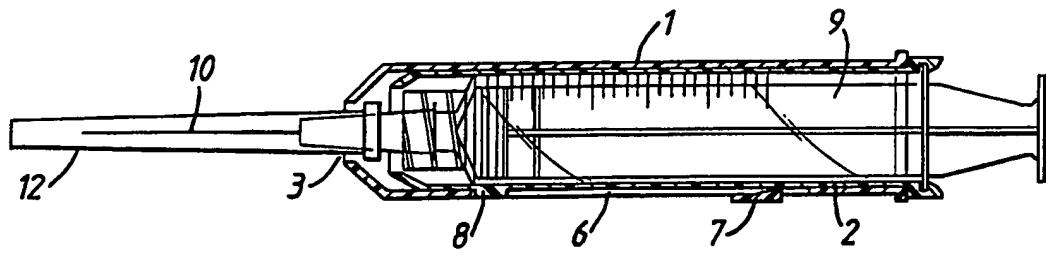


Fig. 6

3/5

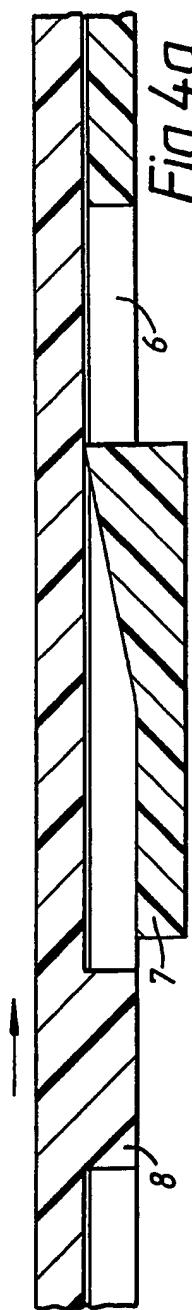


Fig. 4a

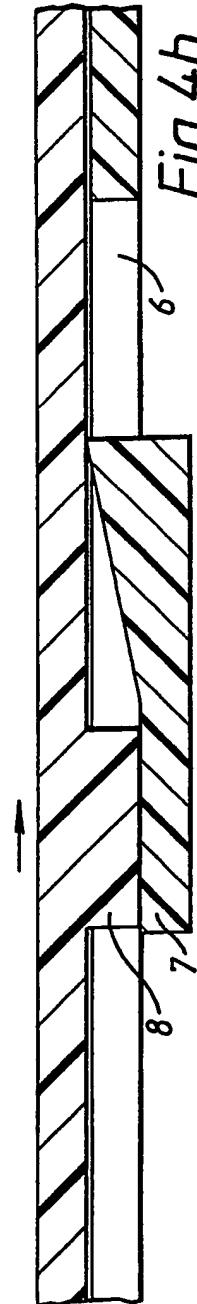


Fig. 4b

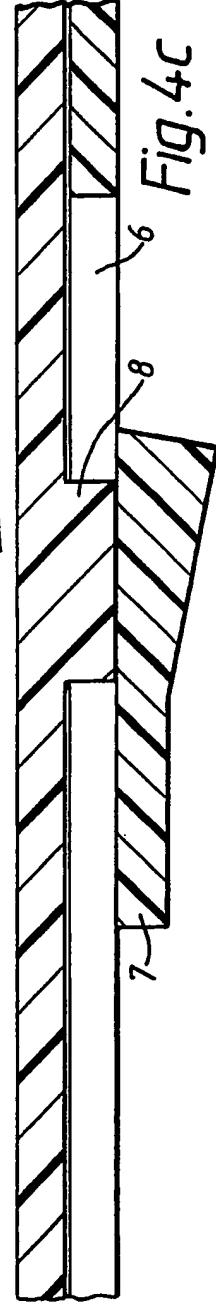


Fig. 4c

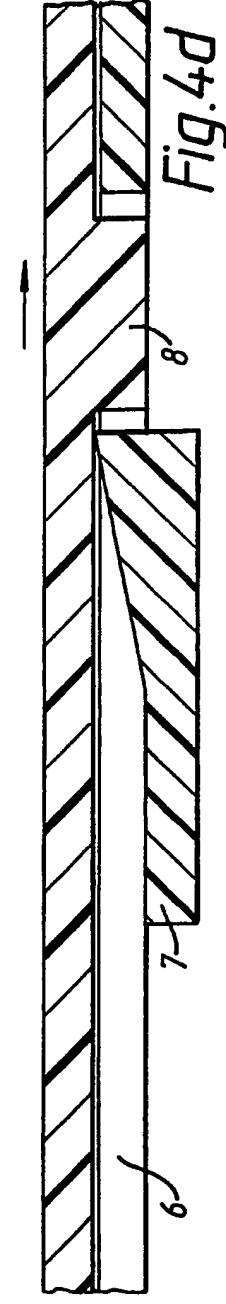


Fig. 4d

4/5

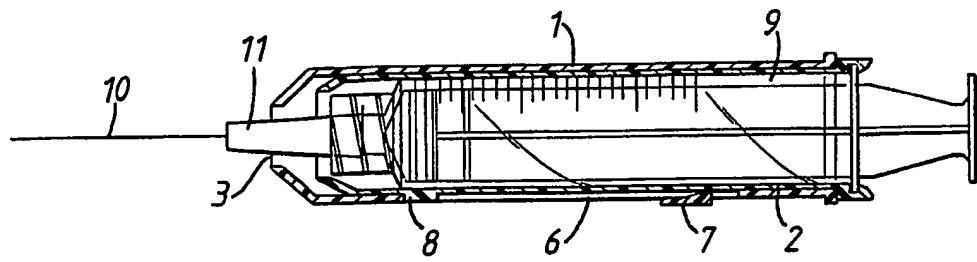


Fig.7

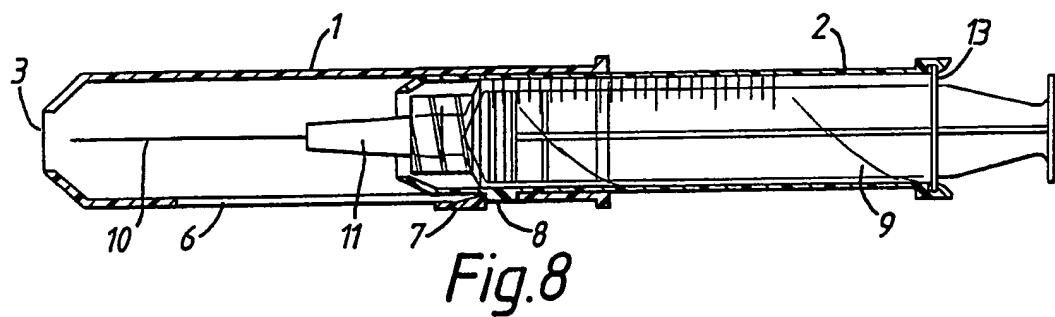


Fig.8

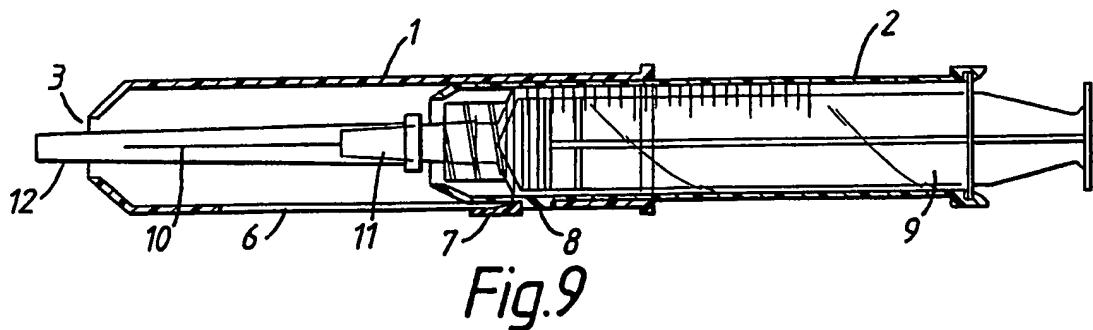


Fig.9

5/5

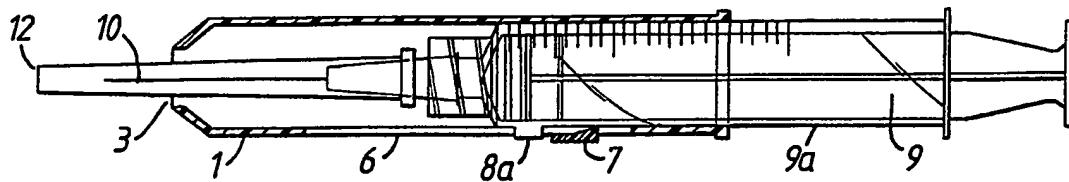


Fig. 10

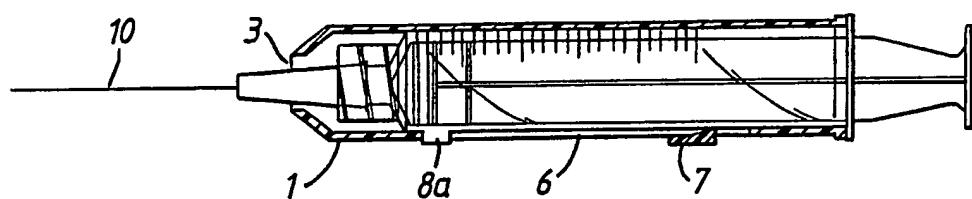


Fig. 11

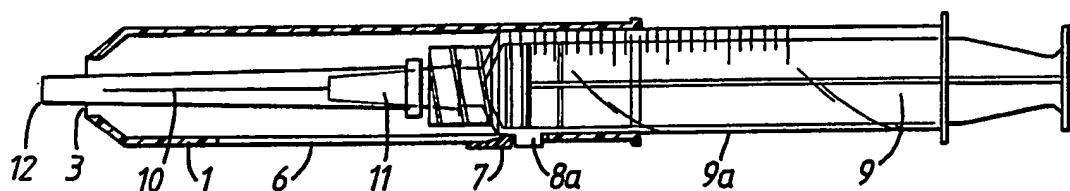


Fig. 12

PROTECTIVE SHEATH FOR A SYRINGE

This invention relates to a protective sheath for a syringe. In particular, but not exclusively, it  
5 relates to a protective sheath for a syringe which can be used in conjunction with a standard syringe used for general medical purposes.

Medical and health personnel who use hypodermic syringes are at risk of accidental needle-stick  
10 injuries caused by exposed needles. Such injuries may cause the medical and health personnel to become infected by infectious agents carried by contaminated needles. With the advent of AIDS, the importance of avoiding needle-stick injuries has become paramount.

15 Therefore, there exists a need to provide a device which can protect medical and health personnel from accidental needle-stick injuries caused by hypodermic needles.

According to a first aspect of the present  
20 invention, there is provided a protective sheath for a syringe having a needle, comprising:

a first tubular member having open ends and an elongate recess which extends in the direction of the longitudinal axis of the member and which includes  
25 locking means; and

a second tubular member, telescopically received in the first tubular member, and having open ends and means for sliding in the recess, the sliding means being arranged to co-operate with the locking means to  
30 lock the first tubular member in an extended position relative to the second tubular member.

Embodiments in accordance with the first aspect of the invention are arranged such that, in use, the second tubular member receives the syringe and the  
35 first tubular member is first telescopically retracted over the second tubular member to expose the needle for

use and then, after the syringe has been used, is telescopically extended over the second tubular member into said extended position so that the needle is substantially enclosed.

5 Preferably, the sliding means is a lug located on the surface of the second tubular member. The second tubular member may, in use, be secured to a syringe by means of a plurality of catches which receive a flange on the syringe.

10 The locking means may comprise a T-shaped member having two arms secured to the surface of the first tubular member on respective sides of the recess and a tapered flexible flap located in the recess.

15 The invention also provides the combination of a syringe and a protective sheath in accordance with the first aspect of the present invention.

20 According to a second aspect of the present invention, there is provided the combination of a syringe having a needle and a protective sheath for the needle, the sheath comprising:

a tubular member having open ends and an elongate recess which extends in the direction of the longitudinal axis of the member and which includes locking means,

25 wherein the syringe is received in the tubular member and has means for sliding in the recess which is arranged to co-operate with the locking means to lock the tubular member in an extended position relative to the syringe.

30 Embodiments in accordance with the second aspect of the invention are arranged being such that, in use, the tubular member is first telescopically retracted over the syringe to expose the needle for use and then, after the syringe has been used, is telescopically 35 extended over the syringe into said extended position so that the needle is substantially enclosed.

Preferably, the sliding means is a lug located on the surface of the syringe.

The locking means may comprise a T-shaped member having two arms secured to the surface of the tubular member on respective sides of the recess and a tapered flexible flap located in the recess.

In certain embodiments of the invention, the recess is an aperture and, in other embodiments, it is a channel.

10 The protective sheath of the present invention enables a hypodermic needle to be exposed only when it is used to perform a medical task and to be withdrawn into the protective sheath for disposal immediately after the task has been completed, thus reducing the 15 chances of the handlers receiving accidental needle-stick injuries.

For a better understanding of the invention and to show how the same may be carried into effect, reference will now be made, by way of example only, to the 20 accompanying drawings, in which:

Figures 1a and 1b are respective front and rear schematic perspective views of a protective sheath according to a first embodiment of the present invention;

25 Figure 2 is a schematic bottom view of the protective sheath of Figure 1;

Figure 3 is a schematic sectional view along the line II-II' of Figure 2;

30 Figures 4a to 4d are enlarged illustrations of the locking system of the protective sheath of Figure 1 at different operating positions;

35 Figure 5 is a view similar to Figure 3, in which a syringe with a hypodermic needle surrounded by a needle cover is shown inserted into the protective sheath which is extended but with its component parts as yet unlocked;

Figure 6 is a view similar to Figure 5, in which the sheath is retracted;

Figure 7 is a view similar to Figure 6, in which the needle cover is removed from the hypodermic needle  
5 and the syringe is ready to use;

Figure 8 is a view similar to Figure 7, in which the protective sheath is fully extended and locked against relative displacement of the component parts;

Figure 9 is a view similar to Figure 8, in which  
10 the hypodermic needle has a cover in place so as to be ready for disposal;

Figure 10 is a view similar to Figure 5 of a protective sheath in accordance with a second embodiment of the present invention;

15 Figure 11 is a view similar to Figure 7 of the protective sheath of Figure 10; and

Figure 12 is a view similar to Figure 9 of the protective sheath of Figure 10.

Referring to Figure 1, a protective sheath in  
20 accordance with a first embodiment of the present invention is in the form of a hollow tube having openings at either end and comprises an outer casing 1 and an inner casing 2 that can slide telescopically within the outer casing 1. Each casing is preferably  
25 made of clear plastics material. The sheath has, at one end, a circular opening 3 in the outer casing 1 and, at the other end, a circular opening 4 in the inner casing 2.

The inner casing 2 has four inwardly directed  
30 clips 5 which, as explained below, are arranged to receive a flange normally found on a standard syringe.

Referring to Figures 2 and 3, the outer casing 1 has an elongate slot 6 extending parallel to its longitudinal axis along a part of its length. The slot  
35 6 includes a catch 7 attached near one end thereof. The catch 7 is a T-shaped member with two arms attached

to the outer surface of the outer casing 1 either side of the slot 6 and a middle flexible tapered flap received in the slot 6.

The inner casing 2 has a lug 8 on its outer 5 surface which is received in the slot 6.

Together, the catch 7 and the lug 8 serve to lock the inner and outer casings in a fully extended position and also prevent the inner casing 2 from rotating within the outer casing 1.

Figures 4a to 4d show how lug 8 and catch 7 serve 10 as a locking mechanism for the inner and outer casings. In Figure 4a, the inner and outer casings are able to move freely relative to one another in the longitudinal direction, with the lug 8 moving in slot 6 without 15 coming into contact with the catch 7. As shown in Figure 4b, when the inner casing is moved in the direction of the arrow relative to the outer casing, the lug 8 slides along the slot 6 towards the tapered end of the flexible flap of the catch 7. As the lug 8 20 continues to move in the direction of the arrow, it lifts the flexible flap out of the slot 6, as illustrated in Figure 4c. Continued movement of the lug 8 causes it to pass the flexible flap of the catch 7 which snaps back into the slot 6 as soon as the lug 8 25 has passed (Figure 4d). In this position, the lug 8 is trapped between the thick end of the flexible flap and the end of the slot 6, locking the inner and outer casings relative to one another.

Referring now to Figure 5, the use of the device 30 will now be described. With the outer 1 and inner 2 casings in the unlocked position and therefore freely slidable or retractable, a syringe 9 is inserted through the opening 4 of the inner casing 2 until its flange 13 enters into snap-locking engagement with the 35 four clips 5. A hypodermic needle 10 attached to the syringe 9 and covered by needle cover 12 protrude

partially from the opening 3 of the outer casing 1.

The inner casing 2 is then telescopically retracted fully into the outer casing 1, causing the hypodermic needle 10 and cover 12 to extend completely through the opening 3 of the outer casing 1 (see Figure 6). As shown in Figure 7, the needle cover 12 can then be removed to expose the hypodermic needle 10 and the syringe 9 can be used to perform the required medical task.

10        Immediately after the syringe has been used, the flange 13 of the syringe is held and the inner casing 2 is completely extracted from the outer casing 1 so that the needle 10 is completely enclosed in the outer casing 1 (see Figure 8). The casings are locked in position by lug 8 passing catch 7 as the inner casing 2 is extracted from the outer casing 1 (as described in Figures 4a-d). As an added precaution, the needle cap 12 is inserted into the opening 3 of the outer casing 1 and pressed firmly onto the base 11 of the needle (see 15 Figure 9). The entire assembly, namely, the protective sheath with the encased syringe and hypodermic needle, can then be disposed of safely.

20        This embodiment of the invention does not require conventional syringes or hypodermic needles to be modified or redesigned.

25        Alternatively, in accordance with a second embodiment of the present invention, a conventional syringe can be slightly modified so that only the outer casing need be used. As shown in Figures 10-12, a modified syringe is provided only with the outer casing 1. The outer surface of the syringe barrel 9a has a lug 8a attached thereto which slides in the slot 6 of the outer casing 1 in the same way as the lug 8 of the inner casing 2. Figure 11 shows how the hypodermic 30 needle 10 is exposed by telescopically retracting the outer casing 1 over the syringe 9.

After use, the outer casing is telescopically extended with respect to the syringe barrel 9a so that the hypodermic needle 10 is enclosed in the outer casing 1. The lug 8a on the syringe barrel 9a slides 5 past the catch 7 to lock the outer casing 1 in position in a manner similar to the lug 8, see Figure 12. The needle cover 12 can be inserted through the opening 3 of the outer casing 1 and pressed firmly onto the needle base 11 for the protected syringe to be disposed 10 of.

The elongate slot 6 which passes through the wall of the outer casing 1 may, in some embodiments, be replaced by an elongate groove or channel in the inner surface of the outer casing.

15 It will be appreciated that the protective sheath should be provided in a variety of sizes which correspond to the sizes of syringes presently available. In addition, the syringe should fit snugly in the protective sheath so that the required medical 20 tasks can be carried out accurately and efficiently.

CLAIMS:

1. A protective sheath for a syringe having a needle, comprising:
  - a first tubular member which has open ends and an elongate recess, the elongate recess extending in the direction of the longitudinal axis of the first tubular member and including locking means; and
  - a second tubular member which is telescopically received in the first tubular member, is arranged, in use, to receive a syringe, and has open ends and means for sliding in the recess, the sliding means being arranged to co-operate with the locking means to lock the first tubular member in an extended position relative to the second tubular member.
- 15 2. A protective sheath for a syringe as claimed in claim 1, wherein the sliding means is a lug located on the surface of the second tubular member.
3. A protective sheath for a syringe as claimed in claim 1 or claim 2, wherein the second tubular member has a plurality of catches which, in use, receive and secure a flange on the syringe.
4. A protective sheath for a syringe as claimed in claim 1, 2 or 3, wherein the locking means comprises a T-shaped member having two arms secured to the surface of the first tubular member on respective sides of the recess and a tapered flexible flap located in the recess.
5. A protective sheath for a syringe as claimed in any preceding claim, wherein the recess is an aperture.
6. A protective sheath for a syringe as claimed in any preceding claim, wherein the recess is a channel.
7. The combination of a syringe and a protective sheath as claimed in any preceding claim.
- 35 8. The combination of a syringe having a needle

and a protective sheath for the needle, the sheath comprising:

a tubular member having open ends and an elongate recess which extends in the direction of the

- 5 longitudinal axis of the member and which includes locking means,

wherein the syringe is received in the tubular member and has means for sliding in the recess which is arranged to co-operate with the locking means to lock

- 10 the tubular member in an extended position relative to the syringe.

. 9. A combination as claimed in claim 8, wherein the sliding means is a lug located on the surface of the syringe.

- 15 10. A combination as claimed in claim 8 or claim 9, wherein the locking means comprises a T-shaped member having two arms secured to the surface of the tubular member on respective sides of the recess and a tapered flexible flap located in the recess.

- 20 11. A combination as claimed in claim 8, 9 or 10, wherein the recess is an aperture.

12. A combination as claimed in claim 8, 9 or 10, wherein the recess is a channel.

13. A protective sheath for a syringe having a needle substantially as hereinbefore described with reference to, and as shown in, Figs. 1-9 of the accompanying drawings.

- 25 14. A combination of a syringe having a needle and a protective sheath for the needle substantially as hereinbefore described with reference to, and as shown in, Figs. 5-9 of the accompanying drawings.

- 30 15. A combination of a syringe having a needle and a protective sheath for the needle substantially as hereinbefore described with reference to, and as shown in, Figs. 10-12 of the accompanying drawings.

10

**Patents Act 1977**  
**Examiner's report to the Comptroller under Section 17**  
**(The Search report)**

Application number  
 GB 9321542.4

-10-

Relevant Technical Fields

- (i) UK Cl (Ed.N) A5R (RGG)  
 (ii) Int Cl (Ed.6) A61M 5/32, 5/50

Search Examiner  
 MR N A FRANKLIN

Date of completion of Search  
 30 JANUARY 1995

Databases (see below)

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

(ii) NONE

Documents considered relevant following a search in respect of Claims :-  
 1-7, 13, 14

Categories of documents

- |    |   |    |   |
|----|---|----|---|
| X: | Document indicating lack of novelty or of inventive step.   | P: | Document published on or after the declared priority date but before the filing date of the present application.        |
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| A: | Document indicating technological background and/or state of the art.   | &: | Member of the same patent family; corresponding document.   |

Category	Identity of document and relevant passages		Relevant to claim(s)
A	GB 2208604 A	(PARAPIA & COX) note Figures 1 and 2 and page 5 line 32 - page 6 line 2	
A	GB 2202748 A	(MINISCHETTI) note Figures 1 to 3 and page 4 line 17 - page 5 line 4	
A	GB 2202747 A	(DUCAT) note eg. Figure 1	
X	US 4998924	(SHERWOOD MEDICAL COMPANY) note figures	1, 2, 5-7
X	US 4923447	(MORGAN) note Figure 4	1, 2, 5-7
X	US 4874384	(INTERNATIONAL MEDICAL INNOVATORS) note eg. column 7 line 62 - column 8 line 19 7 Figures 6 to 8a	1, 3, 5-7

Databases: The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).